

presented by a sun-spot are not due to radiation from such a source as that indicated by M. Faye, but that we have in this absorption-hypothesis a complete or partial solution of the problem which has withstood so many attacks.

The dispersive power of the spectroscope employed was not sufficient to enable me to determine whether the decreased brilliancy of the spot-spectrum was due in any measure to a greater number of bands of absorption, nor could I prove whether the thickness of the bands in the spot-spectrum, as compared with their thickness in the photosphere-spectrum, was real or apparent only\*.

On these points, among others, I shall hope, if permitted, to lay the results of future observations before the Royal Society. Seeing that spectrum-analysis has already been applied to the stars with such success, it is not too much to think that an attentive and *detailed* spectroscopic examination of the sun's surface may bring us much knowledge bearing on the physical constitution of that luminary. For instance, if the theory of absorption be true, we may suppose that in a deep spot rays might be absorbed which would escape absorption in the higher strata of the atmosphere; hence also the darkness of a line may depend somewhat on the depth of the absorbing atmosphere. May not also some of the variable lines visible in the solar spectrum be due to absorption in the region of spots? and may not the spectroscope afford us evidence of the existence of the "red flames" which total eclipses have revealed to us in the sun's atmosphere; although they escape all other methods of observation at other times? and if so, may we not learn something from this of the recent outburst of the star in Corona?

#### IV. "On a Crystalline Fatty Acid from Human Urine."

By E. SCHUNCK, F.R.S. Received September 21, 1866.

(Abstract.)

After referring to the various forms in which fatty matter occurs in human urine, and to our extremely defective knowledge regarding its physical and chemical properties, the author proceeds to describe a process whereby he obtained from healthy urine a small quantity of a substance having the properties characteristic of the fatty acids which are solid at the ordinary temperature. The process consists in passing urine, after having been filtered in order to separate all insoluble matter which may have been deposited, through animal charcoal in an ordinary percolating apparatus. The urine is thereby completely decolorized and deodorized, a small quantity of charcoal producing this effect on a large quantity of urine. The charcoal, after being thoroughly washed with water, is treated with boiling alcohol, to which it communicates a bright yellow colour like

\* Irradiation would cause bands of the same thickness to appear thinnest in the more brilliant spectrum.

that of urine itself. The filtered alcoholic liquid is evaporated, and the residue is treated with water, which leaves undissolved a quantity of brownish-yellow fatty matter. This, after being purified in the manner described by the author, is found to consist principally of a fatty acid, having the properties characteristic of the group to which palmitic and stearic acid belong. The acid is white, crystalline, has a pearly lustre, melts at  $54^{\circ}3$  C., volatilizes unchanged when heated, and is insoluble in water but easily soluble in alcohol and ether. It is soluble in caustic potash and soda-lye, in aqueous ammonia, and in solutions of carbonate of potash and carbonate of soda. The solutions froth on being boiled like ordinary soap and water. The potash compound is obtained from the watery solution in the form of small pearly scales, and from an alcoholic solution in prismatic crystals. The soda-compound separates from a boiling-hot solution on cooling as a thick, white, amorphous soap, a very small quantity of which is sufficient to cause the liquid to gelatinize. The watery solution of either of these compounds gives white curd-like precipitates with salts of barium, calcium, lead, and silver. The quantity of the acid obtained in the author's experiments was too inconsiderable to enable him to determine its composition and atomic weight, and it therefore remains uncertain whether it is identical with any of the known fatty acids or not. The author inclines to the opinion that it is a mixture of stearic and palmitic acid, which according to modern investigations constitute together what was formerly called margaric acid. The author does not venture to assert that it forms a normal constituent of the healthy secretion, though the urine employed in his experiments in no case exhibited anything peculiar. The experiments described do not throw any light on the question how this acid, which belongs to a class of substances almost insoluble in water, comes to be dissolved in a liquid like urine, which is itself usually acid.

#### V. On Oxalurate of Ammonia as a Constituent of Human Urine."

By E. SCHUNCK, F.R.S. Received November 15, 1866.

(Abstract.)

When ordinary healthy urine is passed through animal charcoal in the manner described in the preceding paper, several organic substances are separated and absorbed by the charcoal in addition to the fatty acid there referred to. The liquid obtained by treating the charcoal with boiling alcohol having been evaporated, the residue is treated with water, which leaves the fatty acid undissolved. The filtered liquid yields on evaporation a quantity of crystals, which, after being purified in the manner described by the author, are found to have the properties and composition of oxalurate of ammonia. The watery solution of the substance gives with acids a white crystalline precipitate of oxaluric acid; with nitrate of silver it produces a precipitate which dissolves without change in boiling